REMARKS

I. Amendments to the Claims

Claims 1-13 are all the claims currently pending in the present application. After entry of this amendment, claims 1-6, 9, 10, and 13-16 will be all the claims pending in the application.

Claim 1 has been amended to more clearly recite the inventive process. The amendments to claim 1 are supported throughout the specification, particularly at pages 5 and 6 and in Fig. 1.

Claims 2-6, 9, 10, and 13 have also been amended to clarify the claimed invention.

Claims 7, 8, 11, and 12 have been canceled.

New claims 14-16 have been added.

Claim 14 recites the process of claim 1, further comprising drying the solid phase obtained in step f) so as to recover the remaining alcohol and a solid fraction suitable for use as cattle feed, and recycling the alcohol obtained in step j) to step c). Claim 14 is supported at page 6, lines 16-18 of the specification.

Claim 15, supported at page 4, line 16, recites the process of claim 1 wherein the anhydrous alcohol is ethyl alcohol.

Claim 16, supported at page 8, lines 25-27, recites the process of claim 13 wherein the neutralized alkyl esters obtained as biodiesel fuel in step i) are formulated into diesel and gasoline fuels by admixture with anhydrous or hydrated ethyl alcohol.

No new matter has been added.

II. Objections to the Drawings

At page 2, paragraph 2 of the Office Action, the drawings were objected to as failing to comply with 37 C.F.R. § 1.84(p)(5).

Specifically, the Examiner stated that the following reference characters, which appear in the drawings, are not mentioned in the description: 34, 35, 36, 38, and 39. The Examiner required corrected drawing sheets or amendment to the specification to add the reference characters.

In response, Applicants have amended Fig. 1 and the corresponding pages of the specification, so that the all of the reference characters in the figure appropriately correspond to the reference characters set forth in the specification.

Accordingly, Applicants respectfully request reconsideration and withdrawal of this objection.

III. Objections to the Specification

A. Abstract

At page 3, paragraph 3 of the Office Action, the abstract of the disclosure was objected to for use of improper legal phraseology.

Specifically, the Examiner required correction of the term "comprising."

In response, Applicants have amended the Abstract by replacing the term "comprising" with the term "including."

B. Title

At page 4, paragraph 4 of the Office Action, the title of the present application was objected to as not being sufficiently descriptive.

In response, Applicants have replaced the title with a new descriptive title that reads as follows: "Process for producing biodiesel fuel using triglyceride-rich oleagineous seed directly in a transesterification reaction in the presence of an alkaline alkoxide catalyst."

C. Informalities

At page 4, paragraph 5, the disclosure was objected to for including several informalities.

Specifically, the Examiner stated that reference characters 34, 35, 36, 38, and 39 of Fig. 1 were not mentioned in the description, and that the word "residua" is allegedly misspelled at page 3, line 33. The Examiner required appropriate correction.

With regard to the reference characters of Fig. 1, this issue is discussed above under "Objections to the drawings." Specifically, Applicants have amended Fig. 1 and the corresponding pages of the specification, so that the all of the reference characters in the figure are also mentioned in the description.

With regard to the word "residua," Applicants note that this word is the plural of "residuum," and is correctly spelled at page 3, line 33 of the specification.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the objections to the specification.

IV. Objections to the Claims

At pages 4 and 5, paragraph 6 of the Office Action, claims 1, 10, 12 and 13 were objected to because of the following informalities:

The Examiner stated that in claim 1, each of the process steps recited in a)-e) should begin with words that are small case rather than capitalized, and that the phrase "preparing in a reactor *an* homogeneous suspension" should be replaced with "preparing in a reactor *a* homogeneous suspension." The Examiner further stated that in claim 9, the phrase "having a granulometry up to 20 mesh Tyler" should be replaced with "having a granulometry *of* up to 20 mesh Tyler." Finally, the Examiner noted that the spacing in claims 10, 12, and 13 should be corrected.

In response, Applicants note that the claims have been amended in order to clarify the claimed invention. These amendments to the claims have either corrected the informalities cited by the Examiner, or rendered the objections moot.

Thus, Applicants respectfully request reconsideration and withdrawal of the objections to the claims.

V. Claim Rejections Under 35 U.S.C. § 112, Second Paragraph - Indefiniteness

At page 5, paragraph 7 of the Office Action, claim 10 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Specifically, the Examiner asserted that claim 10 is not clear with respect to the phrase "conventional fermentation process on the carbohydrates."

Applicants have amended claim 10 such that the claim recites "the fermentation process of step l)" rather than "conventional fermentation process on the carbohydrates."

Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

VI. Claim Rejections Under 35 U.S.C. § 103(a) - Obviousness

A. Stidham in view of Bradin, Drouillard, and Saam

At page 7, paragraph 10 of the Office Action, claims 1, 2, 4, 6, 8, and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Stidham et al. (U.S. Patent Number 6,127,560) in view of Bradin (U.S. Patent Number 5,578,090), Drouillard et al. (U.S. Patent Number 6,506,423), and Saam (U.S. Patent Number 5,750,751).

The Examiner's characterization of the cited references and the reasons in support of the rejection are clearly set forth in the Office Action. For purposes of brevity, they are not repeated here.

Applicants respectfully traverse this rejection, for at least the following reasons.

Applicants submit that the process described and claimed in the present application is fundamentally different from the process set forth in Stidham. In particular, in the present process the seeds are fed directly into a reactor where they are mixed with anhydrous alcohol and catalyst for transesterification (see, e.g., page 6, lines 1 and 2). Thus, the present invention avoids an oil extraction step. In contrast, Stidham describes a process including a step of pre-processing soybean seeds before the transesterification step. Specifically, the seeds are subjected to a comminuting step, a heating and drying step, and a partial oil removal step. Then the crude oil is degummed and bleached before being finally subjected to the esterifying step. (See, e.g., Fig. 1 of Stidham). At column 3, lines 8-36, Stidham notes that the benefits of the process include mechanical removal of the oil, low levels of gum and high conversion to lower methyl esters, and a highly purified ester product after washing. In further contrast to the present invention, Stidham also includes a last step of washing the products by trickling water (see, e.g., step (i) in claim 1 of Stidham). Thus, Stidham teaches a method for preparing a lower alkyl ester product from soybean oil extracted from the oleaginous seed, in which the process steps are fundamentally different from those of the present application.

Further, Bradin, Saam, and Drouillard are clearly not sufficient to overcome the deficiencies of Stidham. In particular, none of these references teach or suggest using oleaginous seed as raw material for a transesterification reaction.

For example, Bradin teaches a fuel additive composition that includes fatty acids alkyl esters and glyceryl ethers as well as a method for preparing the same. Column 4, lines 21-27 of the reference describe an alternative diesel fuel containing between 5 and 75% of the fuel additive composition. Therefore, Bradin claims a fuel additive composition comprising between 10 and 75 % fatty acid alkyl esters wherein alkyl means a group of C1-C10 straight, branched or cyclic alkanes that totally differ from the present invention in which glyceryl ether is not applied to the diesel fuel when the biodiesel is admixed.

In addition, Saam discloses a method for preparing co-esters obtained by an acid catalyzed esterification reaction. This reaction is not related to the present application.

With regard to Drouillard, this reference is related to a feedstuff obtained by a reaction utilizing a carbohydrase enzyme. In contrast, the present invention describes a feedstuff obtained through utilization of a dried flour by-product of the recited process, without any additional steps. The fermentation process is applied only in order to produce alcohol for recycling to the transesterification reaction. Thus, Drouillard does not teach or suggest the present invention.

Accordingly, Applicants submit that the cited references do not teach all of the limitations of the present claims. In addition, a person of ordinary skill in the art would not have

been motivated to combine the references with a reasonable expectation of success in obtaining the claimed invention.

Thus, Applicants respectfully request reconsideration and withdrawal of this rejection.

B. Stidham in view of Bradin, Drouillard, Saam, and Lidgren

At page 9, paragraph 11 of the Office Action, claims 2 and 3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Stidham in view of Bradin, Drouillard, Saam, and further in view of Lidgren (U.S. Pre-Grant Publication Number 2003/0161858).

Specifically, the Examiner stated that although Stidham does not explicitly disclose using oily seeds besides soybeans, Lidgren discloses oils from seeds such as sunflower, colza, soybean, peanut, and castor (citing page 3, paragraph 34). The Examiner concluded that it would have been obvious to one skilled in the art to use the various oils obtained from the listed oil seeds of Lidgren in Stidham's process because these oils have similar desirable properties (citing page 3, paragraph 32).

Applicants respectfully traverse this rejection.

First, Stidham, Bradin, Drouillard and Saam, addressed above, do not teach or suggest the present invention.

Second, Lidgren does not remedy the deficiencies of those references. In particular, this reference generally describes methods of mixing bone mineral substitute material with various

biologically compatible oils. Applicants note that at page 3, paragraph 34, "castor oil" is cited as an example of an animal oil, instead of castor beans as claimed in the present invention. Therefore, any biologically compatible oil, including mineral oil, can be used alone or in combination to produce the composition described in Lidgren. On the contrary, the present invention utilizes any triglyceride-rich oleaginous seed, preferably castor beans, having between 15 and 70% weight of esterifiable triglycerides (see page 4, lines 19-22 of the specification). Thus, Lidgren is not related to the present invention.

Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

C. Stidham in view of Bradin, Drouillard, Saam, and Thames

At page 10, paragraph 12 of the Office Action, claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Stidham in view of Bradin, Drouillard, and Saam, and further in view of Thames et al. (U.S. Patent Number 6,897,255).

Specifically, the Examiner stated that although Stidham does not explicitly disclose sodium or potassium ethanoate as catalysts in the disclosed process, Thames discloses sodium and potassium acetate catalysts (citing Col. 15, lines 12-23), wherein acetate is a synonym for ethanoate. The Examiner concluded that it would have been obvious to one skilled in the art to use the catalysts of Thames in Stidham's process because sodium and potassium acetate are particularly suitable in transesterification type reactions (citing Col. 15, lines 12-13).

Applicants respectfully traverse this rejection.

Stidham, Bradin, Drouillard and Saam do not teach or suggest the present invention, as addressed above.

Furthermore, Thames does not remedy the deficiencies of Stidham, Bradin, Drouillard and Saam. In particular, Thames describes a process for the synthesis of a latex composition, involving an esterification reaction between a substituted long-chain alkenol and an ethylenically unsaturated carboxylic acid. The reaction may be carried out with or without any catalyst (Col. 14, lines 50-53). This reference simply mentions common catalysts used in transesterification reactions in general, and does not teach or suggest the present invention.

Therefore, Applicants respectfully request reconsideration and withdrawal of this rejection.

D. Stidham, Bradin, Drouillard, Saam, and Buchanan et al.

At page 11, paragraph 13 of the Office Action, claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Stidham in view of Bradin, Drouillard, Saam, and further in view of Buchanan et al. (U. S. Patent Number 6,573,396).

Specifically, the Examiner's position is that although Stidham does not explicitly disclose using recycled alcohol, Buchanan discloses using recycled alcohol in a transesterification reactor (citing Col. 9, lines 3-15). According to the Examiner, it would have been obvious to one skilled in the art to use the recycled alcohol of Buchanan with Stidham's process because overall

process efficiency is increased (citing Col. 9, lines 1-2), thereby obtaining the invention as set forth in claim 7.

Applicants first note that claim 7 has been canceled. However, amended claim 9 and new claim 14 each recite a step in which alcohol is recovered for recycling.

Because Stidham, Bradin, Drouillard and Saam do not teach or suggest the present invention, and Buchanan does not remedy the deficiencies of those references, Applicants respectfully traverse the Examiner's position.

Stidham, Bradin, Drouillard and Saam are discussed above.

With regard to Buchanan, Applicants submit that the process described in Buchanan does not teach or suggest the present invention. Instead, Buchanan relates to a process for production of a dialkyl carbonate and a diol from a cyclic carbonate and an aliphatic monohydric alcohol that are reacted in the presence of a transesterification catalyst. Applicants note that recycling is frequently used in order to increase overall process efficiency. In contrast, present claim 9 (amended) is directed to producing ethanol by an additional fermentation step aimed at the overall sustainability of the process, including further use of one of its by-products.

Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

E. Stidham, Bradin, Drouillard, Saam, Buchanan, and Anderson

At page 11, paragraph 14 of the Office Action, claims 9-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Stidham in view of Bradin, Drouillard, and Saam, further in view of Buchanan, and further in view of Anderson (U.S. Patent Number 5,710,030).

Specifically, the Examiner stated that although Stidham does not explicitly disclose fermenting the carbohydrates obtained from the soybean cake to produce ethanol for recycling back to the transesterification reactor, Anderson discloses milling oilseeds to produce a vegetable oil and a residual mixture of complex polymeric carbohydrates, wherein the carbohydrates are depolymerized to produce a high yield of fermentable sugars. The Examiner also noted that these sugar-containing mixtures are then fermented using yeast, bacteria, or fungi, in order to convert the sugars to lower alkanols, especially ethanol (citing Col. 3, lines 24-39). The Examiner therefore concluded that it would have been obvious to one skilled in the art to use the ethanol produced by fermentation as disclosed by Anderson in Stidham's process, because the ethanol so produced may be used for a transesterification process as one integrated process (citing Col. 2, lines 4-67).

Applicants respectfully traverse this rejection.

Stidham, Bradin, Drouillard, Saam, and Buchanan do not teach or suggest the present invention, for at least the reasons set forth above.

In addition, the Anderson reference relied on by the Examiner in this rejection does not remedy the deficiencies of Stidham, Bradin, Drouillard, Saam, and Buchanan. Specifically,

Anderson describes a process for making fatty acid lower alkyl ester from oilseeds. This process is not related to the process of the present invention.

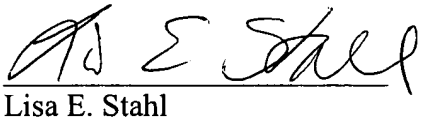
Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

VII. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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AMENDMENTS TO THE DRAWINGS

The attached one (1) sheet of the drawings (Figure 1) includes the following changes:

Figure 1 has been amended so that the reference characters shown in the figure correspond to the reference characters set forth in the amended specification.

Attachment: Replacement Sheet for Figure 1

Annotated Sheet for Figure 1

Inventor's name: Carlos Nagib KHAKIL, et al.
Title: Process for producing biodiesel
Application No.: 10/621,569
Filed: July 18, 2003
Group Art Unit: 1714
SUGHRUE Reference No.: Q76639
SUGHRUE Telephone No.: 202-293-7060
ANNOTATED SHEET

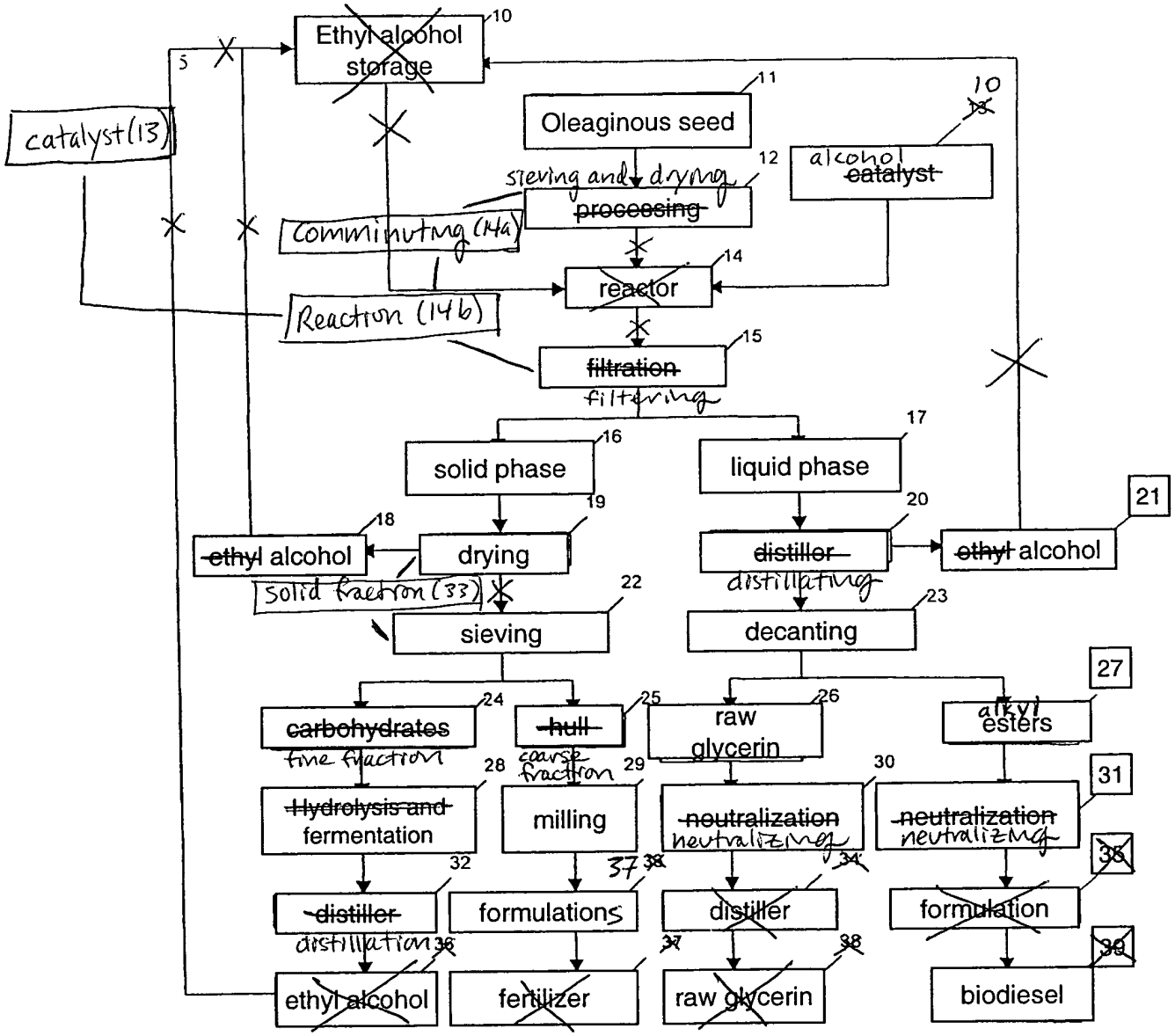

Figure 1